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USSR RAILROADS GET NEW EQUIPMENT

A new high-speed Series L freight locomotive has been developed and added to the rolling stock of the USSR railroads. It has an improved firebox and large boiler heating surface. The locomotive easily develops 2,000 horsepower and has a relatively light axle load of 18.2 tons which permits it to be used on lightly constructed track.

The weight norm for freight trains in the past 5 years has been increased 14 percent and the average speed excluding stops has increased 16 percent.

The increased volume of hauling requires the construction of still more powerful locomotives.

The Ulan-Ude Plant produced a new 2-10-4 experimental locomotive with an axle load of 22.5 tons which successfully passed the tests in 1951. In comparison with the S0 locomotive, this simply constructed locomotive will make it possible to increase the carrying capacity of double-track lines 50 percent. It will be even more effective on single-track lines, where its high speed will permit an increase of the traffic capacity of the line.

Tests of a new 4-8-4 passenger locomotive have just been completed. When this locomotive is put into operation the speed and weight of passenger trains will also be increased. The weight of the consists, compared with those drawn by Series Su locomotives, will be increased 20-25 percent. The 4-8-4 locomotive, which has an axle load of 18.5 tons, will be used extensively.

Since the end of the war great efforts have been made toward modernizing the existing stock of locomotives. Locomotive workers have been steadily equipping locomotives with Trofimov by-pass or drifting valves, replacing small tube steam superheaters with large tube steam superheaters, improving the steam distributing mechanisms, and developing new methods in insulating boilers, etc. New-type water heaters, steam driers, and other locomotive equipment are being tested. All of this should increase the efficiency of the locomotives.

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In 1950 the articulated TE-2 diesel with two engines developing a total of 2,000 horsepower was put into series production. At present, a new experimental diesel, the TE-3, with a 2,000-horsepower engine has been planned. The combined operation of two such units would result in a 4,000-horsepower locomotive.

Soviet specialists are working on the problem of converting diesels to solid fuel operation. Tests conducted by the All-Union Scientific Research Institute of Railroad Transport have shown that diesels operating on generator gas save 80-85 percent of expensive diesel fuel. The first experiments conducted with diesels operating on generator gas gave reason to believe that this problem will be successfully solved. At present, the VL-22-m electric locomotive, which has an 0-6-6-0 wheel arrangement and an axle load of 22 tons, is being produced. The capacity of this locomotive is 17 percent greater than that of the VL-19 and VL-22 locomotives, which were produced prior to the war. It has now become necessary to create a new powerful eight-axle main line electric locomotive with a weight on drivers of 180 tons and a capacity of 4,000 kilowatts. Motor and trailing cars of suburban electric trains are now equipped with new electropneumatic brakes, which reduce braking distance and increase smoothness of braking. The electrical equipment of the new motor car sections of the Sr Series allow them to operate on either 1,650 or 3,300 volts. This arrangement will make it possible in the future to electrify the suburban sections at 3,300 volts and gradually to convert the existing lines from the lower to the higher voltage, which is more economical.

There has been a considerable increase in the number of installations for the hot water washing of locomotives and in the number of coal cranes. At many places the fuel supply and ash handling installations have been mechanized and a number of water-softening plants have been built. There also has been an increase in the use of the direct-steaming process for locomotives; this saves fuel and rids the enginehouse of smoke and soot. Mechanization of labor-consuming and heavy work in the locomotive depots is being done through the use of hoisting-transporting machinery and automatic and semiautomatic devices. In the depots extensive use has been made of bridge and walking cranes, light traveling cranes, cableways, electric forges, and other types of efficient innovations such as high-frequency tempering of parts, and automatic and semiautomatic welding in the installation and repair of locomotive parts.

Serious attention has been given to the problem of water supply. Many pumping installations have been electrified. This has lowered the cost of supplying water 25-30 percent compared to nonelectrified installations. A number of electrified pumping stations have been converted to automatic control.

Due to the introduction of continuous repair methods at the Kanash Car Repair Base and partly at the Stryy and Barnaul bases, the productivity of the Kanash Plant has more than doubled and that of Barnaul has increased 67 percent during the past 5 years.

Interchangeability of parts and assemblies has been introduced at the locomotive repair depots. Specialized sections have been set up for the machining of spare parts, and productional cooperation has been organized among plants for the production of spare parts, locomotive cylinders, and driving rods.

Over 350 machines have been introduced for the electric surface hardening of tools and over 3,000 machine tools have been changed over for high-speed metal processing. To improve the condition of the equipment at the locomotive and car depots and to raise its productivity, the repair of the equipment has been organized in special plants.

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Changes have also taken place in regard to freight car rolling stock. The proportion of four-axle boxcars, gondolas, flatcars, tank cars, and refrigerator cars has been increased with a corresponding increase in the carrying capacity of the rolling stock. The number of freight cars equipped with automatic brakes increased 6.9 percent during the past 5 years, raising the total of such cars to 76 percent of the existing freight car stock. Now, 52.5 percent of all freight cars have automatic couplers.

The number of four-axle all-metal passenger cars has also increased. At present, operational tests of all-metal first-class, baggage, mail, and dining cars are being carried out.

The rapid increase in the number of four-axle freight and all-metal passenger cars and the increase in the volume of hauling have required a greater mechanization of rolling stock repair at the depots. In the car depots electric, pneumatic, and hydraulic hoists, electric and pneumatic tools, and a number of other devices are now being used. The highly efficient methods of building up worn surfaces with multiple electrodes and the welding of cast iron without preheating have also been introduced. The quality of the electric and gas welding apparatuses has been improved. In addition, mechanized points for the running repair of cars have been set up in the marshaling yards.

Extensive use has been made of defect-detecting devices to promote safe train movement. To supplement existing instruments for the detection of flaws in car axle journals there have been introduced detecting devices which permit the detection of flaws in the arch bars of the freight car trucks. Tests are also being carried out with these detecting devices to find hidden flaws in the wheel tires and in the accessible part of the axle.

The increase in freight traffic density and increased axle loads have required stronger track. This has lead to the introduction of heavier rail, the electric welding and hardening of rail ends, the electric contact welding of old and new rail, and an increase in the amount of mechanized track work. It has been proved that, from the standpoint of durability and economy of metal and labor, rail types R-43 and R-50 are most satisfactory. For that reason they were made standard in 1947 and have been laid in increasing quantity.

In addition to the heavy rail, new and improved rail fastenings and anticreepers were introduced. The spring-type anticreeper has been accepted as standard. A new-type switch with a 1/15 frog which will permit faster speeds has also been developed. New frogs with all-steel cast points with wing rails of wear-resistant steel have been developed.

Life of rail has now been lengthened by means of electric contact welding.

A new defect detector truck, the DS-13, developed by the Tomsk Physicotechnical Institute for detecting flaws in rail, is now being used on many sections of track. A new type of fast detector car for finding hidden defects in rail is now undergoing tests. Since the war more than 20 types of new machinery have been introduced: mechanical ballasters, track layers, track plows, self-unloading cars, ballast cleaning machines, and others.

In the capital repair of track the time saved through mechanization amounts to 40 percent, in medium repair 30 percent.

The automatic centralized control of humping operations has increased the output of switching stations, decreased car layover, and diminished the damage to cars in humping operations.

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The use of train and intrastation radio communication has increased. Automatic telephone service has been extended.

Mechanization of loading and unloading operations has been increased 182 percent in the last 5 years.

At the end of 1950 excavation work was 84.3 percent mechanized, assembly of metal structures 97.5 percent, crushing rock for gravel 91.1 percent, preparation of concrete 95.6 percent, preparation of mortar 85.4 percent, and the laying of track 44.2 percent.

However, it must be noted that the mechanization of excavating, plastering, painting, and ballasting and track laying is lagging behind schedule. This is explained by the unsatisfactory use of machinery by the workers.

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